

33343-01

WE CLAIM:

- 1 1. A process for the preparation of a ~~coated~~
2 pesticidal matrix which process comprises:
 - 3 a) preparing an aqueous mixture comprising a
4 pesticidal agent, a pH-dependent polymer, optionally a
5 plasticizer, optionally an ultraviolet protector,
6 optionally an activity enhancer, optionally a glidant,
7 and water, provided that the pH of the aqueous mixture is
8 below the solubilization pH of the pH-dependent polymer;
9 and
 - 10 b) drying the aqueous mixture of step (a) to produce
11 the ~~coated~~ pesticidal matrix.
- 1 2. The process according to claim 1 wherein the
2 plasticizer is present in the aqueous mixture.
- 1 3. The process according to claim 1 wherein the
2 activity enhancer is present in the aqueous mixture.
- 1 4. The process according to claim 1 wherein the
2 ultraviolet protector is present in the aqueous mixture.
- 1 5. The process according to claim 1 wherein the
2 pesticidal agent is selected from the group consisting of
3 an insecticide, an acaricide, a nematicide, a fungicide
4 and a herbicide and mixtures thereof.
- 1 6. The process according to claim 5 wherein the
2 insecticide agent is a chemical or a biological
3 insecticide.

1 7. The process according to claim 6 wherein the
2 chemical insecticide is selected from the group
3 consisting of chlorfenapyr, hydramethylnon, imidacloprid,
4 1-(6-chloro-3-pyridyl)-2-(nitromethylene)imidazolidine,
5 fipronil, and 1-[1-(*p*-chlorophenyl)-2-fluoro-4-(4-fluoro-
6 3-phenoxyphenyl)-2-butenyl]cyclopropane, (R,S)-(Z)-, and
7 mixtures thereof.

1 8. The process according to claim 6 wherein the
2 biological insecticide is selected from the group
3 consisting of V8vEGTDEL, V8vEGTDEL-AaIT, *Heliothis zea*
4 NPV, *Lymantria dispar* NPV, AcMNPV E2, AcMNPV L1, ACMNPV
5 V8, AcMNPV Px1, and *Bacillus thuringiensis*, and mixtures
6 thereof.

1 9. The process according to claim 1 wherein the
2 pH-dependent polymer is selected from the group
3 consisting of an ethyl acrylate/methacrylic acid
4 copolymer, a methyl methacrylate/methacrylic acid
5 copolymer, a methacrylic acid/methyl acrylate/methyl
6 methacrylate copolymer, and mixtures thereof; the
7 plasticizer is selected from the group consisting of a
8 poly(ethylene glycol), a poly(propylene glycol), a citric
9 acid ester, diethyl phthalate, dibutyl phthalate, castor
10 oil, triacetin, and mixtures thereof; the ultraviolet
11 protector is selected from the group consisting of carbon
12 black, a benzophenone, a dye, titanium dioxide, and
13 mixtures thereof; the activity enhancer is a stilbene
14 compound; and the glidant is selected from the group
15 consisting of talc, magnesium stearate, calcium stearate,
16 calcium sulfate, and mixtures thereof.

1 10. The process according to claim 9 wherein the
2 pH-dependent polymer is selected from the group

3 consisting of an ethyl acrylate/methacrylic acid
4 copolymer wherein the ratio of free carboxyl groups to
5 esters is about 1:1, a methyl methacrylate/methacrylic
6 acid copolymer wherein the ratio of free carboxyl groups
7 to esters is from about 1:1 to about 1:2, a methacrylic
8 acid/methyl acrylate/methyl methacrylate copolymer
9 wherein the ratio of the monomers is about 1:5:2 to
10 3:7:3, and mixtures thereof; the plasticizer is selected
11 from the group consisting of triethyl citrate and a
12 poly(ethylene glycol) having an average molecular weight
13 of about 1,000 to 10,000; and the stilbene compound is
14 selected from the group consisting of Blancophor BBH,
15 Calcofluor White M2R, Phorwite AR, and mixtures thereof.

1 11. The process according to claim 1 wherein the
2 pH-dependent polymer is a methyl methacrylate/methacrylic
3 acid copolymer and is partially solubilized with base.

1 12. The process according to claim 11 wherein the
2 base is selected from the group consisting of ammonium
3 hydroxide, an alkali metal hydroxide, and an alkaline
4 earth metal hydroxide.

1 13. The process according to claim 1 wherein in
2 said drying step the aqueous mixture is spray dried.

1 14. The process according to claim 1 wherein the
2 ~~coated~~ pesticidal matrix has a particle size less than
3 about 20 μm .

1 15. The process according to claim 14 wherein the
2 ~~coated~~ pesticidal matrix has a particle size of about
3 2 μm to 10 μm .

1 16. The process according to claim 1 wherein the
2 ~~coated~~ pesticidal matrix comprises about 1 to 50% by
3 weight of the pesticidal agent, about 5 to 50% by weight
4 of the pH-dependent polymer, 0 to about 25% by weight of
5 the plasticizer, 0 to about 30% by weight of the
6 ultraviolet protector, 0 to about 75% by weight of the
7 activity enhancer, and 0 to about 15% by weight of the
8 glidant.

1 17. A ~~coated~~ pesticidal matrix which comprises
2 about 1 to 50% by weight of a pesticidal agent, about 5
3 to 50% by weight of a pH-dependent polymer wherein, ~~a~~ ^{about}
4 ~~substantial number~~ ^{90% to 100%} of the free carboxylic acid groups in
5 said polymer have not been converted to their salt form,
6 0 to about 25% by weight of a plasticizer, 0 to about 30%
7 by weight of an ultraviolet protector, 0 to about 75% by
8 weight of an activity enhancer, and 0 to about 15% by
9 weight of a glidant.

1 18. The ~~coated~~ pesticidal matrix according to claim
2 17 which comprises about 5 to 35% by weight of the
3 pesticidal agent, about 10 to 45% by weight of the pH-
4 dependent polymer, 0 to about 25% by weight of the
5 plasticizer, 0 to about 20% by weight of the ultraviolet
6 protector, 0 to about 45% by weight of the activity
7 enhancer, and 0 to about 10% by weight of the glidant.

1 19. The ~~coated~~ pesticidal matrix according to claim
2 17 wherein the pH-dependent polymer is selected from the
3 group consisting of an ethyl acrylate/methacrylic acid
4 copolymer, a methyl methacrylate/methacrylic acid
5 copolymer, a methacrylic acid/methyl acrylate/methyl
6 methacrylate copolymer, and mixtures thereof; the
7 plasticizer is selected from the group consisting of a
8 poly(ethylene glycol), a poly(propylene glycol), a citric

9 acid ester, diethyl phthalate, dibutyl phthalate, castor
10 oil, triacetin, and mixtures thereof; the ultraviolet
11 protector is selected from the group consisting of carbon
12 black, a benzophenone, a dye, titanium dioxide, and
13 mixtures thereof; the activity enhancer is a stilbene
14 compound; and the glidant is selected from the group
15 consisting of talc, magnesium stearate, calcium stearate,
16 calcium sulfate, and mixtures thereof.

1 20. The ~~coated~~ pesticidal matrix according to claim
2 19 wherein the pH-dependent polymer is selected from the
3 group consisting of an ethyl acrylate/methacrylic acid
4 copolymer wherein the ratio of free carboxyl groups to
5 esters is about 1:1, a methyl methacrylate/methacrylic
6 acid copolymer wherein the ratio of free carboxyl groups
7 to esters is from about 1:1 to about 1:2, a methacrylic
8 acid/methyl acrylate/methyl methacrylate copolymer
9 wherein the ratio of monomers is about 1:5:2 to 3:7:3,
10 and mixtures thereof; the plasticizer is selected from
11 the group consisting of triethyl citrate and a
12 poly(ethylene glycol) having an average molecular weight
13 of about 1,000 to 10,000; and the stilbene compound is
14 selected from the group consisting of Blancophor BBH,
15 Calcofluor White M2R, Phorwite AR, and mixtures thereof.

1 21. The ~~coated~~ pesticidal matrix according to claim
2 17 wherein the pesticidal agent is a chemical insecticide
3 or a biological insecticide.

1 22. The ~~coated~~ pesticidal matrix according to claim
2 21 wherein the chemical insecticide is selected from the
3 group consisting of chlorfenapyr, hydramethylnon,
4 imidacloprid, 1-(6-chloro-3-pyridyl)-2-(nitromethylene)-
5 imidazolidine, fipronil, and 1-[1-(p-chlorophenyl)-2-

6 fluoro-4-(4-fluoro-3-phenoxyphenyl)-2-butenyl] cyclo-
7 propane, (R,S)-(Z)-, and mixtures thereof.

1 23. The ~~coated~~ pesticidal matrix according to claim 21
2 wherein the biological insecticide is selected from the
3 group consisting of V8vEGTDEL, V8vEGTDEL-AaIT, *Heliothis*
4 *zea* NPV, *Lymantria dispar* NPV, AcMNPV E2, AcMNPV L1,
5 ACMNPV V8, AcMNPV Px1, and *Bacillus thuringiensis*, and
6 mixtures thereof.

1 24. The ~~coated~~ pesticidal matrix according to claim
2 17 having a particle size of less than about 20 μm .

1 25. The ~~coated~~ pesticidal matrix according to claim
2 24 having a particle size of about 2 μm to 10 μm .

1 26. A wettable powder pesticidal composition which
2 comprises about 0.5 to 40% by weight of a dispersing
3 agent; about 1 to 10% by weight of a flow enhancing
4 agent; about 10 to 70% by weight of a bulking agent; 0 to
5 about 25% by weight of a wetting agent; 0 to about 35% by
6 weight of a pH-modifying agent; and about 5 to 75% by
7 weight of a ~~coated~~ pesticidal matrix according to claim
8 17.

1 27. The composition according to claim 26 which
2 comprises about 2 to 15% by weight of the dispersing
3 agent; about 1 to 10% by weight of the flow enhancing
4 agent; about 10 to 60% by weight of the bulking agent;
5 0 to about 15% by weight of the wetting agent; 0 to about
6 20% by weight of the pH-modifying agent; and about 5 to
7 75% by weight of the ~~coated~~ pesticidal matrix.

1 28. The composition according to claim 26 wherein
2 the pesticidal agent in the ~~coated~~ pesticidal matrix is a
3 biological agent.

1 29. The composition according to claim 28 which
2 comprises about 2 to 10% by weight of the dispersing
3 agent; about 1 to 10% by weight of the flow enhancing
4 agent; about 20 to 50% by weight of the bulking agent;
5 about 2 to 20% by weight of the pH-modifying agent; and
6 about 15 to 60% by weight of the ~~coated~~ pesticidal
7 matrix.

1 30. The composition according to claim 26 wherein
2 the pH-modifying agent is an organic acid.

1 31. The composition according to claim 30 wherein
2 the organic acid is citric acid.

1 32. The composition according to claim 30 wherein
2 the organic acid has a mean particle size greater than
3 about 50 μm .

1 33. The composition according to claim 32 wherein
2 the organic acid has a mean particle size greater than
3 about 100 μm .

1 34. A ~~coated~~ pesticidal matrix produced by the
2 process of claim 1.

1 35. A method for improving the residual control of
2 a pest which comprises applying to the locus of the pest
3 a pesticidally effective amount of a ~~coated~~ pesticidal
4 matrix according to claim 34.

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